



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1459
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,626	04/28/2006	Ryuzo Iga	14321.84	9935
22913	7590	02/04/2009	EXAMINER	
Workman Nydegger 1000 Eagle Gate Tower 60 East South Temple Salt Lake City, UT 84111			STAFFORD, PATRICK	
			ART UNIT	PAPER NUMBER
			2828	
			MAIL DATE	DELIVERY MODE
			02/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/577,626

Applicant(s)

IGA ET AL.

Examiner

PATRICK STAFFORD

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4 and 16-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 16-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)
Paper No(s)/Mail Date 11/17/2008
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Claims 2, 5-15 cancelled 17 November 2008.

Claims 1, 3, 16 amended 17 November 2008.

Claims 17-21 added 17 November 2008.

Response to Arguments

Applicant's arguments filed 17 November 2008 have been fully considered but they are not persuasive.

In response to applicant's argument that Takahiro '582 does not teach a current-blocking layer that is a single layer and a high-resistive layer made of InP crystal doped with Ru, Takahiro is not relied upon to teach this limitation. Instead, Takemi '856 is introduced to teach a current blocking layer being a single high resistive layer of InP crystal doped with ruthenium (paragraph 21) in order to act as an electron compensator (paragraph 23). Therefore, the combination of Takahiro '582 and Takemi '856 as well as Iga '856 teach the device of claims 1 and 16.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-4, 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahiro et al (Japanese Published Patent Application 03-053582, hereafter '582) in view of Takemi et al (U.S. Patent Application Publication 2004/0057483, hereafter '483) and further in view of Iga et al (U.S. Patent Application Publication 2002/0168856, hereafter '856).

Claims 1 and 16: '582 teaches a semiconductor optical device comprising:

a mesa-stripe stacked body (translation page 1, paragraph 2 and Fig. 3) including at least a p-type cladding layer (Fig. 3, part 23), an active layer (Fig. 3, part 19) and an n-type cladding layer (Fig. 3, part 24) is formed on a p-type InP substrate (translation page 1, paragraph 1, lines 9-10 and Fig. 3, part 21),

a current-blocking layer is buried in both sides of said stacked body (Fig. 3, parts 12-15), and an n-type over-cladding layer (Fig. 3, part 18) and an n-type contact layer (Fig. 3, part 22) are disposed on said current-blocking layer and said stacked body (Fig. 3, parts 18 and 22 disposed on part 12),

wherein said current blocking layer is a high resistive layer made of an InP crystal doped with Fe (translation page 2, paragraph 1 and Fig. 3, parts 12-15); and

said n-type over-cladding layer is made of a semiconductor crystal having a property for flattening a concavo-convex shape of upper surfaces of said current-blocking layer and said stacked body (Fig. 3, part 18 flat upper surface).

'582 does not explicitly teach an n-type dopant for said semiconductor crystal is a group VI element. However, '483 teaches a semiconductor optical device with an n-type semiconductor crystal with a group VI element as the dopant (paragraph 30, lines 9-12) in order to flat the surface of the cladding layer and reduce the number of crystal dislocations. Therefore,

it would have been obvious to one having ordinary skill in the art at the time the invention was made to use an n-type semiconductor crystal with a group VI element as the dopant in order to flat the surface of the cladding layer and reduce the number of crystal dislocations.

'582 and '483 do not teach the current blocking layer is a single high-resistive layer is doped with ruthenium. However, '856 teaches a current blocking layer being a single high resistive layer of InP crystal doped with ruthenium (paragraph 21) in order to act as an electron compensator. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a current blocking layer being a single high resistive layer of InP crystal doped with ruthenium in order to act as an electron compensator.

Claims 3 and 17: '582, '483 and '856 teach the semiconductor optical device according to claim

1. '483 teaches the n-type dopant is selenium (paragraph 30, lines 9-12).

Claim 4: '582, '483 '856 teach the semiconductor optical device according to claim 3. '483 teaches the doping concentration of the selenium is equal to or higher than $5 \times 10^{18} \text{ cm}^{-3}$ (paragraph 72, lines 2-4).

Claims 18 and 20: '582, '483 '856 teach the semiconductor optical device according to claim 1.

'582 teaches the current- blocking layer is disposed directly on the p-type InP substrate so as to contact the p-type InP substrate (Fig. 3, part 15 disposed directly on part 21).

Claims 19 and 21: '582, '483 '856 teach the semiconductor optical device according to claim

18. '582 teaches the n-type over-cladding layer is disposed directly on the current-blocking layer so as to contact the current- blocking layer (Fig. 3, part 18 formed directly on part 12).

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK STAFFORD whose telephone number is (571)270-1275. The examiner can normally be reached on M-Th 7:30-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. S./
Examiner, Art Unit 2828

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828